CONN. R. BELOW HARTFORD

WETHERSFIELD COVE

CONNECTICUT

SURVEY

(REVIEW OF REPORTS)

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

JULY 7, 1960

SURVEY

REVIEW OF REPORTS

CONNECTICUT RIVER BELOW HARTFORD

WETHERSFIELD COVE, CONNECTICUT

SYLLABUS

The Division Engineer finds that the general navigation facilities at Wethersfield Cove are inadequate for the present needs of the recreational fleet and that benefits are sufficient to warrant Federal improvement. He therefore recommends the modification of the existing project for the Connecticut River below Hartford, Connecticut to provide for an entrance channel 6 feet deep, generally 60 feet wide, and 1,200 feet long from the Connecticut River into Wethersfield Cove; and a 30-acre anchorage, 6 feet deep, in the cove, generally as shown on the inclosed map. The estimated first cost of construction is $80,000 (June 1960).

The project is recommended subject to the requirement that local interests contribute 50 percent of the construction cost, provide spoil disposal areas and maintain adequate public access and landings. The cash contribution is estimated at $40,000. The net cost to the United States is $40,000 for construction and $7,000 for preauthorization studies, with annual maintenance costs of $1,100 for the project. The benefit-cost ratio is 1.5.

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U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM 54, MASS.

NEDGW

7 July 1960

SUBJECT: Survey (Review of Reports) Connecticut River Below Hartford, Wethersfield Cove, Connecticut

TO: Chief of Engineers, Department of the Army, Washington, D. C.
ATTN: ENGCW-P

AUTHORITY

1. This report is submitted in compliance with a resolution adopted June 20, 1955 by the Committee on Public Works of the United States Senate which reads as follows:

> "RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be and is hereby requested to review the report of the Chief of Engineers on Connecticut River Below Hartford, Connecticut published as House Document No. 49, Seventy-Third Congress, First Session, and other reports, with a view to determining the advisability of modifying the existing project at this time, with particular reference to the Improvement of Harbor Facilities in Wethersfield Cove."

2. The Chief of Engineers by letter dated June 27, 1955 assigned a review report to the New England Division Engineer.

3. The report under review was submitted by the District Engineer, Providence, Rhode Island, on September 26, 1932. It recommended improvement of the Connecticut River from its mouth to Hartford. The improvement recommended consisted of a channel 300 feet wide and 15 feet deep to the Old Lyme railroad bridge, - thence generally 150 feet wide and 15 feet deep to Hartford. This report is the basis for the existing project in the Connecticut River below Hartford.

PURPOSE AND EXTENT OF STUDY

4. This study considered the engineering and economic justification of small boat navigation improvements in Wethersfield Cove. A detailed hydrographic survey including soundings and probings was made. The use of this harbor and other harbors in the vicinity was studied to determine the

adequacy of present facilities and the need for additional navigational improvement. A public hearing was held at Wethersfield on March 4, 1958. Information presented at the hearing is described under "Improvement Desired". Subsequent to the hearing, local government officials were consulted. Available maps, charts, and aerial photographs were studied and field trips were made to obtain data.

DESCRIPTION OF NAVIGATION CONDITIONS

5. Wethersfield Cove is a small landlocked bay on the west bank of the Connecticut River about 3 miles below Hartford, Connecticut, and 48 miles up river from Long Island Sound. The entrance channel is narrow, crooked, and shoal. The Cove is roughly circular in shape, with an average diameter of about 2,000 feet and an area of about 70 acres. Generally, depths in the Cove are ample for small boats, having one area of 23 acres with depths ranging from 12 to 18 feet and another of 25 acres with depths ranging from 6 to 12 feet. However, the northern portion of the Cove is of little or no value as an anchorage, that shore being a wildlife area, entirely undeveloped. Local interests oppose use of this part of the Cove for navigation as conflicting with its present use as a wildlife habitat. Just south of the center of the Cove there is a shoal of about 4 acres with depths ranging from 2.5 to 6 feet which creates a hazard to navigation and restricts full navigational use of the Cove. Except for this shoal there are about 30 acres of area in this part of the Cove with depths in excess of 6 feet.

6. A narrow shallow channel extends from the Cove to the river. This channel is about 1,200 feet long and 30 to 90 feet wide with a controlling depth of about 3.5 feet at mean low water. The mean range of tide is about 1 foot. Spring and occasional fall freshets usually reach 16 to 24 feet, but the river levels are 5 feet above mean low water or higher only about 60 days a year. The area is shown on U. S. Coast and Geodetic Chart No. 267, on the Army Map Service Hartford South Quadrangle and on the map accompanying this report.

TRIBUTARY AREA

7. The area immediately tributary to the Cove is the town of Wethersfield in which the entire area of the Cove is located. It is primarily a residential town having a few small industries and local retail establishments. The Connecticut State Prison is located on land abutting the southerly shore of the Cove. The population of the town in 1950 was 12,353 and its assessed valuation in 1957 was $66,587,730.

8. The city of Hartford must also be considered as part of the tributary area. It is the capitol and largest city in the State with a population in 1950 of 177,937. Its assessed valuation in 1957 was $572,012,940.

BRIDGES AFFECTING NAVIGATION

9. There are no bridges crossing the Cove itself. However, on September 28, 1956 the State of Connecticut was issued a permit to construct a fixed bridge over the entrance channel. It will have a vertical clearance of 39 feet above mean high water and a horizontal clearance of 70 feet.

10. There is also a concrete sewer line crossing underneath the entrance channel. It is 9 feet 6 inches wide by 5 feet 2 inches high, with a top elevation of 6.2 feet below local mean low water. This sewer is the main trunk outfall of the Hartford Metropolitan District.

PRIOR REPORTS

11. Wethersfield Cove has not been considered in prior reports. The Connecticut River below Hartford has been subject to several navigation studies, including the report under review. Tabulated below are the most recent navigational studies on the river:

Scope and Date of Report	Work Considered	Recommendation
Survey published in House Document 666, 80th Congress, Second Session	Incorporation of the Eight Mile River project into the Connecticut River project. Provision of 8-foot channel and turning basin in Eight Mile River and additional anchorage in the upper cove at Hamburg.	Favorable
Preliminary Examination and Survey published in House Document 368, 76th Congress, First Session	Entrance channel 100 feet wide, 12 feet deep into North Cove. Provision of anchorage facilities in North Cove, 12 acres with 11-foot depth, 17 acres with 6-foot depth.	Favorable
* Survey published in House Document 49, 73rd Congress, First Session	Channel 15 feet deep, 300 feet wide to Old Lyme Railroad Bridge thence 150 feet wide to Hartford. Construction of dikes and training structures.	Favorable

* Report under review.

EXISTING CORPS OF ENGINEERS PROJECT

12. The existing project for improvement of the Connecticut River Below Hartford, Connecticut, was adopted in 1872 and modified in 1881, 1911, 1919, 1935, 1945 and 1950. It provides for:

a. A channel 15 feet deep, 300 feet wide from the mouth of the river to Lyme Railroad Bridge, thence 15 feet deep; generally 150 feet wide to Hartford. Length about 52 miles.

b. A channel 11 feet deep, 100 feet wide from deep water in the river to the anchorage in North Cove. Length about 1,900 feet.

c. Two anchorages 6 feet and 11 feet deep in North Cove.

d. Two riprap jetties at the mouth of the river.

e. The construction of dikes, training walls, revetments and accessory works.

f. A training dike about 3,700 feet long at Hartford.

g. A channel 8 feet deep and 75 feet wide in Eight Mile River from the Connecticut River to Hamburg and a turning basin of the same depth, 150 feet wide and 300 feet long at Hamburg and an anchorage area at Hamburg, 6 feet deep and about 6.5 acres in area.

13. The existing project is about 70% completed. Federal costs to 30 June 1959 were $1,149,358 for new work and $3,042,448 for maintenance. To complete the project there remains the construction of additional permanent works, dredging the channel and anchorage in North Cove, Old Saybrook, Connecticut and dredging the 6-foot anchorage in Eight Mile River at Hamburg. With the exclusion of the work in Eight Mile River which is considered to be inactive (estimated to cost $57,000 in 1956) the Federal cost to complete the project is estimated at $433,000 (July 1959).

14. There is no Federal improvement authorized in Wethersfield Cove.

LOCAL COOPERATION ON EXISTING AND PRIOR REPORTS

15. The River and Harbor Act of August 30, 1935 authorized the 15-foot channel to Hartford together with dikes, revetments, and training walls subject to the provision that local interests furnish free of cost to the United States suitable areas for dredged materials during initial construction and for future maintenance, when and as needed, and hold and save the United States free from damage that may result from the construction works or subsequent maintenance. Local interests have complied with this requirement. The River and Harbor Act of March 2, 1945 authorized the channels and anchorage in North Cove subject to the provision that

local interests contribute in cash 50 percent of initial construction costs not to exceed $67,500 and provide a public landing estimated to cost $13,000. The River and Harbor Act of May 17, 1950 authorized the channel, basin and anchorage in Eight Mile River subject to the provision that local interests provide adequate public landing facilities, suitable spoil disposal areas, when and as needed, and contribute in cash 50 percent of initial construction costs not to exceed $18,000. As funds for the latter two parts of the project have not been appropriated, these requirements have not been met.

OTHER IMPROVEMENTS

16. The Wethersfield Yacht Club maintains a system of 9 buoys to mark the entrance channel into the Cove. These buoys are placed in position about the middle of June and taken up in October. The Town of Wethersfield maintains a large parking area, boat trailer ramp, and two landings. These facilities are open to all on equal terms and are regularly policed and supervised by the Town Harbormaster.

TERMINAL AND TRANSFER FACILITIES

17. There are three wharves and one boat launching ramp in the Cove. Two of the wharves are owned by the town of Wethersfield, the other by the local Yacht Club. The boat-launching ramp is owned by the town. The town wharves are located on the easterly shore of the Cove. They are of pile and timber construction. Both wharves project 60 feet from the shore and have a 20-foot float moored at the ends. The wharves are in good condition.

18. The Yacht Club wharf consists of a 60-foot long bulkhead parallel to the shore with a 60-foot long wharf perpendicular to one end. Construction is of wood pile and timber. This wharf is in excellent repair. The Yacht Club also maintains a railway for hauling boats. Its capacity is limited to 35' boats.

19. All of the wharves have berthing depths of 6 or more feet. The Yacht Club maintains a service float with provisions for the sale of motor fuel, lubricant and potable water open to all on equal terms. The two town wharves have float, piers, and mooring facilities, as well as parking areas and access roads. There is police and fire protection in the area, as well as a harbormaster who controls boat operation on the Cove.

IMPROVEMENT DESIRED

20. In order to give local interests an opportunity to express their views with respect to improvement of Wethersfield Cove, a public hearing was held in the Senior High School Auditorium, Wethersfield, Connecticut, on Tuesday, 4 March 1958. The hearing was attended by 103 persons, including representatives of Federal, State and local governments and by recreational and yachting interests.

21. The town authorities and representatives of the local Yacht Club described existing conditions and suggested the following improvements which were considered essential for the full use of the Cove for recreation and as a safe harbor of refuge.

a. The area between the Connecticut River channel and the entrance to the Cove which has shoaled to a depth of only 2 feet should be dredged to a suggested depth of 10 to 12 feet to provide a safe entrance to the Cove.

b. The channel between the river and the Cove has shoaled badly on both sides and should be widened to the full width possible through the proposed bridge structure. The channel should be dredged to about 4.5 feet.

c. The existing anchorage area in the Cove is restricted by shoal areas and is considered inadequate for the large number of moorings required. The entire Cove should be dredged to a depth of 12 feet below mean low water to permit its full use by the local fleet. In this connection it was reported that the Cove has been badly shoaled by silt from Folly Brook, a small stream that flows into the west side of the Cove. The brook drains a small watershed west of the Cove and water pumped from behind the Hartford dike. However, in view of the suburban character and size of the watershed it does not appear that silting from Folly Brook is an appreciable problem.

22. All present agreed that the above-stated improvements were essential. The owner of the sewer line requested that adequate facilities be provided to prevent any service interruption and to finance the cost of alterations if any work was considered that would require alteration of the sewer. Other interests requested that the wildlife area owned by the city of Hartford north of the Cove be left undisturbed.

EXISTING AND PROSPECTIVE COMMERCE

23. At the present time there is no commerce in the waterway. Local interests have indicated that commercial development of the Cove is neither desired nor anticipated.

VESSEL TRAFFIC

24. Vessel traffic in the waterway is confined to recreational boating. There is an existing fleet of 232 recreational boats, including 101 outboards. It is estimated that each of these boats average at least a trip a week for a season of about 120 days. Thus the total number of boat trips would be in the vicinity of 4,500 trips including transient boats.

DIFFICULTIES ATTENDING NAVIGATION

25. The principal difficulties attending navigation stem from shoaling which has occurred in the Connecticut River between the river channel and the entrance to Wethersfield Cove. Shoaling has also taken place along the sides of the entrance channel. The controlling depth near the west bank of the Connecticut River at the entrance is approximately 3.5 feet while in the entrance channel to the Cove it is about 6 feet at mean low water. The width of the channel at several spots, however, is only 30 feet making passing extremely hazardous. Navigation in the Cove is impeded by shoal areas.

WATER POWER AND OTHER SPECIAL SUBJECTS

26. The waterway is tidal. Matters involving water power, flood control, pollution or other related subjects are not pertinent to this report. The U. S. Fish and Wildlife Service has advised that the considered work would have no adverse effect on fish or wildlife. Their full report is given in Appendix B.

PLAN OF IMPROVEMENT

27. A plan of improvement has been selected with consideration being given to the specific local desires, the current and anticipated fleets, and the maximum draft of boats expected to use the waterway. The chief desire of local interests lay in widening and deepening the entrance to the Cove. At the present time the area between the main river channel and the outer entrance to the Cove has a controlling depth of 3.5 feet. Between the outer and inner entrances to the Cove there is a channel about 6 feet deep and an average width of about 30 feet. Another desire of local interests entails deepening of shoals in the center of the Cove. A 4-acre shoal lies immediately south of the center of the Cove and has a least depth of 2.5 feet.

28. The current fleet, wholly recreational, consists of 232 boats. Of these boats 112 are in the outboard or shallow draft inboard classes. The remainder are cruisers, sail, and auxiliary sail. It is considered that the prospective fleet will be about 400 boats including additions to the fleet, and prospective transient boats. The maximum draft of these boats would be about 4.5 to 5 feet.

29. The selected plan of improvement considers dredging of an entrance channel 1,200 feet long, generally 60 feet wide, and 6 feet deep. A width of 60 feet would be double the existing width and provide for safer navigation as the type of boats expected to use the channel could pass in opposite directions without fear of grounding on the banks. The maximum width is further limited by the highway bridge to be constructed over the entrance channel. The channel span width of this bridge will be 70 feet. The channel is flared on the

river end to allow for easier navigation coming into the river current. It was also considered that the entrance, which will be subject to shoaling, should be widened to reduce the frequency of maintenance required.

30. The depth of 6 feet was selected in consideration of the draft of boats using and expected to use the river. The depth of the channel was also limited by the top elevation of the outfall sewer crossing the Cove. Local interests had expressed a desire for a 12-foot depth in the Cove but this would be of little advantage with a 6-foot entrance channel. To provide this depth in the channel would entail lowering of the sewer, which is at a depth of 6.2 feet at M.L.W. Investigation of the need for greater channel depth than 6 feet disclosed that the benefits to be obtained from the few transient boats which might desire to use the Cove would not be sufficient to justify the cost of lowering the sewer and deepening the channel.

31. The plan of improvement would also include provision of about 30 acres of unrestricted, clear anchorage near the south and east shores, where the boating activity is centered. To accompliah this would require removing the 4-acre shoal now situated southerly of the Cove's center. This improvement will provide anchorage for the entire anticipated fleets, both current and prospective.

32. This plan of improvement has been discussed with local interests who are in accord with all phases of the plan.

SHORE LINE CHANGES

33. The improvements desired by local interests will have no adverse effect on adjacent shore lines.

REQUIRED AIDS TO NAVIGATION

34. The United States Coast Guard has been consulted, relative to aids to navigation required after improvement. By letter, dated 10 November 1959, the Commander of the Third Coast Guard District has advised that the private aids to navigation maintained by the Wethersfield Cove Yacht Club would be suitable and sufficient to mark the new channel if relocated by local interests as indicated by the U. S. Coast Guard on their map enclosure. No estimate of cost was supplied as maintenance would still be by local interest. Such costs as are involved are considered to be nominal.

ESTIMATE OF FIRST COST

35. An estimate of the first cost of the improvement considered in this report has been made using price levels prevailing in June 1960. Probings made during the survey indicate that dredging will consist of

mud, sand and gravel. Quantities have been estimated in terms of in-place measurement and provide for dredging to the proposed project depth plus an allowance of one foot for overdepth and with side slopes of one vertical to three horizontal. It is considered that the material will be removed hydraulically and the spoil deposited on the town-owned property east of the Cove and south of the entrance channel.

36. The estimated first cost of the improvement including contingencies is shown below. Detailed costs are included in Appendix A.

Estimated First Cost

Dredging Channel and Anchorage	$69,000
Engineering and Design	5,000
Supervision and Administration	6,000
Project Cost	$80,000
Preauthorization Study	7,000
Total First Cost (June 60)	$87,000

ESTIMATES OF BENEFITS

37. There is no commercial navigation in the Cove at the present time and none is expected to develop. Therefore the benefits to be derived from improvement of the Cove would be accrued by the existing and prospective recreational fleets. These benefits are considered to be equally general and local in nature.

38. Benefits have been computed on the basis of annual net return to the owners if the boats were "for hire". In general the net return varies with the type and size of boat, and is expressed in terms of its average depreciated value. The ideal net return is considered the maximum return that could be obtained with full unrestricted use of the harbor. For this harbor the ideal net return varied from 12 percent for the smaller boats to 7 percent for the larger boats. Computation of the benefits considered the difference between the net return now received with the net return that can be received after improvement. The value of net return entailed consideration of such factors as restrictive anchorage and deficient navigational conditions such as a narrow, shallow, entrance channel. Future value was based on increased use of the harbor made possible by improvement. Computed benefits for the present fleet as a direct result of the improvement amount to $2,300 as shown in Table I.

39. During recent years, boating in Wethersfield has made rapid strides, the fleet increasing in size progressively each year. While not a summer resort, Wethersfield Cove enjoys particular advantages as a recreational boating area. It is within the rapidly growing metropolitan area of Hartford, located apart from the normal river traffic, sheltered in all directions, and has no commercial boating activity in

the waterway. For these reasons the growth of recreational boating has been greater than surrounding communities. Without improvement it is considered that normal growth alone would add 2 to 3 boats per year to the existing fleet. An estimate of this normal growth indicates that 120 boats would be added over the anticipated 50-year life for a Federal project.

40. The annual benefit for these 120 boats due to slightly greater return if the Cove were improved, in similar fashion to that estimated for the present fleet in paragraph 38, is computed in Table II at $1,100. It is assumed that these boats would be added uniformly over the 50-year period, so that the benefit would increase uniformly from zero, when the project is constructed, to $1,100 at the end of 50 years. The average annual equivalent benefit for this series, computed at a 2 5/8 percent interest rate is about $450.

41. Wethersfield Cove, situated near the head of navigation on the Connecticut River is an ideal stop-over for transient boats cruising the Connecticut River. Local interests have stated that current deficient navigational conditions preclude more extensive use of the Cove by transients. Instances of boats cruising the river and being unable to enter the Cove were cited. Local interests were unable to produce exact figures on the number of boats but estimated that about 5 a day enter the Cove for a 2-day stay. This would amount to about 1,200 boat days during the cruising season or the equivalent of 10 locally based boats. In view of the fact that the present local fleet spends nearly 2,000 boat days away on cruise, and that the future total home fleet is estimated to have boats away on cruise for nearly 3 times the number of boat days, estimated for visiting craft at the Cove, and that the neighboring yacht centers compare favorably in number of boats, this estimate appears to be conservative. Benefits for these boats have been computed on the same basis as the local fleet and amount to $500 as shown in Table III.

42. After improvement it is estimated that the transient fleet will increase by at least 50 percent. Local interests consider this estimate conservative. Benefits from this source are estimated as one-half the benefits of the existing transients or $250 annually.

43. Local interests expect that additional boats will be purchased if the Cove is improved. It is conservatively estimated that 25 new boats would be added to the fleet soon after the improvement and as a direct result of the improvement. This number includes 5 outboards and 5 inboard boats that, although they do not need the improvements proposed, would be attracted by construction of a Federal project. No benefits have been estimated for these shallow-draft boats. Benefits for the other 15 boats purchased because of the improvement have been computed as $2,800 annually as shown on Table IV.

44. Several local boat owners, who now base elsewhere in the vicinity, have indicated that they would locate in the Cove should improvement be affected. These boats now base elsewhere because of the difficult navigational conditions. The boats now receive most of the net return possible

and would receive a smaller net gain than the existing fleet. It is estimated that 15 boats would transfer to Wethersfield in the event of improvement. Benefits for these transfers amount to $300 as shown in Table V.

45. It is anticipated that material dredged from the Cove will be placed on town-owned property that is subject to flooding every year when the Connecticut River rises. The volume of material involved is not great enough to raise the area so that it would not be flooded, or improve its value to any extent. Therefore no benefit from land enhancement is expected as a result of the project.

46. The evaluated benefits from the improvement of Wethersfield Cove are summarized below:

Benefits from Increased Recreational Use of the:	General	Local	Total
Existing fleet	$1,150	$1,150	$2,300
Prospective fleet - Normal growth	225	225	450
Existing transient fleet	250	250	500
Attracted transient boats	125	125	250
Attracted new boats	1,400	1,400	2,800
Attracted transferred boats	150	150	300
TOTAL BENEFITS	$3,300	$3,300	$6,600
Percent	50%	50%	100%

APPORTIONMENT OF COSTS AMONG INTERESTS

47. Wethersfield Cove is limited exclusively to recreational boating. Since the benefits which would accrue through improvement of the cove are entirely recreational the benefits are 50 percent local in nature. The first cost of construction of the general navigation facilities should therefore be divided equally between Federal and local interests, and local interests should be required to make a cash contribution. The first costs are as follows:

Federal Investment	
General Navigation Facilities (0.50) ($80,000)	$40,000
Preauthorization Studies	7,000
Total Federal Cost	$47,000
Non-Federal Investment	
Local Cash Contribution (0.50) ($80,000)	$40,000
Total Project Cost	$87,000

TABLE I

Benefits to Existing Fleet

Type of Craft	Length (feet)	No. of Boats	Depreciated Value Average	Depreciated Value Total	Percent Return Ideal	% of Ideal Pres.	% of Ideal Future	Gain	Value $	On Cruise (120-day Season) Avg. Days	% of Season	Value $
Recreational Fleet												
Outboards	10-20	101	$500	$50,500	12	100	100	-	-	-	-	-
Inboards	10-20	11	700	7,700	10	100	100	-	-	-	-	-
Cruisers	15-30	100	1,500	150,000	8	90	100	0.8	$1,200	15	12.5	$150
	31-50	10	8,000	80,000	7	75	100	1.7	1,360	30	25	340
Aux Sail	15-30	3	1,500	4,500	8	65	100	2.8	130	15	12.5	20
Sailboats	10-20	7	1,000	7,000	10	80	100	2.0	140	10	8.3	10
Totals		232		$299,700					$2,830			$520

Total Benefits = $2,830 - $520 = $2,310 Say $2,300

TABLE II

Benefits to Normal Growth Prospective Fleet

Recreational Fleet												
Outboards	10-20	52	$500	$26,000	12	100	100	-	-	-	-	-
Inboards	10-20	6	700	4,000	10	100	100	-	-	-	-	-
Cruisers	15-30	52	1,500	78,000	8	90	100	0.8	620	15	12.5	$75
	31-50	4	8,000	32,000	7	75	100	1.7	540	30	25	135
Aux Sail	15-30	2	1,500	3,000	8	65	100	2.8	80	15	12.5	10
Sailboats	10-20	4	1,000	4,000	10	80	100	2.0	80	10	8.3	10
Totals		120		$147,000					$1,320			$230

Total Benefits = $1,320 - $230 = $1,090 Say $1,100

TABLE III

Benefits to Existing Equivalent Transient Fleet

Type of Craft	Length (feet)	No. of Boats	Depreciated Values Average $	Depreciated Values Total $	Percent Return Ideal	Percent Return % of Ideal Pres.	Percent Return % of Ideal Future	Gain	Value $	On Cruise (120-day Season) Avg. Days	On Cruise (120-day Season) % of Season	On Cruise (120-day Season) Value $
Recreational Fleet												
Cruisers	15-30	6	$1,500	$9,000	8	90	100	0.8	70	-	-	-
	31-50	3	8,000	24,000	7	75	100	1.7	410	-	-	-
Aux Sail	15-30	1	1,500	1,500	8	65	100	2.8	40	-	-	-
Totals		10		$34,500					$520	Say $500		

TABLE IV

Benefits to New Boats

Recreational Fleet												
Outboards	10-20	5	$500	$2,500	12	100	100	-	-	-	-	-
Inboards	10-20	5	700	3,500	10	100	100	-	-	-	-	-
Cruisers	15-30	10	2,000	20,000	8	0	100	8	1,600	15	12.5	200
	31-50	2	10,000	20,000	7	0	100	7	1,400	30	25	350
Sailboats	10-20	3	1,200	3,600	10	0	100	10	360	10	8.3	30
Totals		25		$49,600					$3,360			$580

Total Benefits = $3,360 - $580 = $2,780. Say $2,800

TABLE V

Benefits to Transferred Boats

Recreational Fleet												
Cruisers	15-30	7	$1,500	$10,500	8	95	100	0.4	$40	15	12.5	5
	31-50	3	8,000	24,000	7	85	100	1.0	240	30	25	60
Aux Sail	15-30	1	1,500	1,500	8	80	100	1.6	20	15	12.5	-
Sailboats	10-20	4	1,000	4,000	10	90	100	1.0	40	10	8.3	-
Totals		15		$40,000					$340			$65

Total Benefits = $340 - $65 = $275 Say $300

ESTIMATES OF ANNUAL CHARGES

48. The annual charges for the improvement have been computed on the basis that local interests will contribute in cash 50 percent of the construction cost, and assuming a project life of 50 years. The Federal interest rate is 2.625 percent. The interest rate for non-Federal investment is taken at 3.5 percent, a rate considered reasonable for the town of Wethersfield, which is expected to provide the cash contribution.

49. The annual charges include an estimate for maintenance of the improvement. Periodic dredging will be required to maintain project depths, especially at the junction of the Cove entrance channel with the Connecticut River channel. In the Cove, and in the entrance channel, shoaling is expected to be slow so that maintenance work will be needed only at long intervals of 10 to 15 years. Maintenance dredging at the entrance bar, which will be required every few years, could be economically accomplished in conjunction with the regular maintenance of the Connecticut River channel which has averaged about $1.00 per cubic yard (including all costs) during the past five years.

Federal Annual Charges	
Interest and Amortization (0.03579) ($47,000)	$1,700
Maintenance Dredging (900 c.y./yr.)	1,100
Federal Annual Charges	$2,800
Non-Federal Annual Charges	
Interest and Amortization (0.04263) ($40,000)	$1,700
Total Annual Charges	$4,500

COMPARISON OF BENEFITS AND COSTS

50. A comparison of the estimated benefits for the construction of an entrance channel and anchorage area in Wethersfield Cove evaluated at $6,600 and the annual carrying charges of $4,500 result in a benefit-cost ratio of 1.5.

PROPOSED LOCAL COOPERATION

51. The benefits to be derived from the dredging of the channel are 50 percent general and 50 percent local in nature. Since Federal and local benefits are equal, local interests should be required to contribute in cash 50 percent of the cost of construction, a contribution presently estimated at $40,000.

52. Local interests should also be required to furnish suitable spoil disposal areas for the deposit of dredged material. Local interests have indicated that an area owned by the town south of the entrance channel and between the Cove and the river could be provided. This area is adequate and would require little or no diking to retain the spoil from the improvement dredging, or for the very minor infrequent maintenance dredging within the Cove. The maintenance dredging at the mouth of the entrance channel would be done in conjunction with maintenance of the Connecticut River 15-foot channel. Spoil disposal is done along the river banks, in shoal areas, without dikes. State and Federal Fish and Wildlife agencies have reported that use of these areas would have no adverse effect on their interests.

53. In addition local interests should be required to provide all necessary lands, easements, and rights-of-way for the construction of the project and all retaining dikes, bulkheads, or embankments necessary for spoil disposal for subsequent maintenance of the project, when and as required, and hold and save the United States free from damages that may result from construction and maintenance of the project.

54. Adequate public landing facilities are now maintained by the town on equal terms to all. The town is a competent public body empowered to regulate the use, growth and free development of the Cove facilities. It is therefore considered that the town should be required to maintain adequate public access and landings and regulate the use, growth and free development of the Cove with the understanding that public facilities and the Cove will be open to all on equal terms.

COORDINATION WITH OTHER AGENCIES

55. All Federal, State and local agencies having an interest in the study were notified of the public hearing held in Wethersfield, Connecticut, on 4 March 1958. All present were in favor of an improvement. Correspondence received subsequent to the hearing indicates that the section to the north of the Cove, which has been designated as a natural wildlife area by the State, should not be used for the disposal of spoil. Local interests, including the Town Council, have indicated that the proposed requirements of local cooperation would be met. The Fish and Wildlife Service has advised (see Appendix B) that the proposed improvement will have no adverse effect on either fish or wildlife provided the spoil was deposited in the area designated on the map accompanying this report.

DISCUSSION

56. Wethersfield Cove is a small sheltered Cove, off the Connecticut River in the town of Wethersfield and immediately south of Hartford, Connecticut. Recreational boating is the only navigation use of the Cove and it is almost ideal for this purpose. However, the connecting channel between the Cove and the river is narrow and shoal,

and there is a shoal in the center of the Cove, so that improvements are desired to permit further development of recreational boating.

57. Future development of navigation will be limited by a sewer line which crosses the entrance channel at a depth of 6.2 feet below mean low water and by a through highway bridge to be constructed over the entrance channel with clearances 70 feet wide and 40 feet above mean low water. Within these limits there is room for a substantial increase in recreational use of the Cove, and there is a definite need for additional facilities in the Hartford area for the small and medium size boats that would not be hampered by these limits.

58. Local interests have provided adequate shore facilities. The Yacht Club maintains a dock and small railway, and the town has constructed two docks, a trailer boat launching ramp, and a large parking area. They now desire a Federal project to enlarge the entrance channel and remove shoals in the Cove. A project to best meet the needs of navigation would provide an entrance channel 6 feet deep generally 60 feet wide from the Connecticut River with an anchorage area of about 30 acres 6 feet deep in the Cove. Although a deeper channel might be desirable, the expense of altering the existing sewer line would not be justified. The only dredging required for the anchorage is the removal of a 4-acre shoal near the center of the Cove.

59. The cost of a Federal project is estimated at $87,000 (in June 1960), and the annual charges would be $4,500. The improvement would benefit the existing and prospective recreational fleet, transient boats cruising the river, and induce the purchase of new boats and the transfer of boats from other locations less convenient to their owners. These benefits have been evaluated at $6,600, giving a benefit-cost ratio of 1.5 for the improvement. The general benefits are such that a Federal project is warranted.

60. The indicated requirements of local cooperation for a Federal project include a cash contribution of 50 percent of the construction cost, spoil areas, maintenance of public access and hold and save the United States free from damages. Local interests have been consulted, have approved the plan of improvement and have indicated that the requirements of local cooperation would be met.

61. All other agencies known to have an interest were consulted during the study. Local State and Federal fish and wildlife interests objected to any work that would disturb the wildlife area north of the Cove but are satisfied with the plan of improvement, and have indicated that spoil disposal in the area south of the entrance channel would have no adverse effect on their interests. The improvement would require no changes in the Hartford Metropolitan District Outfall Sewer that passes under the entrance channel, and the work can be accomplished without damaging the structure.

CONCLUSION

62. The needs of recreational navigation at Wethersfield Cove would be satisfied by adoption of a project to provide for a channel 6 feet deep generally 60 feet wide and a 30-acre anchorage also 6 feet deep as shown on the map accompanying this report. The resulting benefits to recreational boating are sufficient to justify the work and to warrant a Federal improvement. Local interests have indicated that the requirements of local cooperation will be met. All agencies known to be interested have been consulted and have expressed no objection to the improvement, provided that nothing is done to disturb the wildlife area north of the Cove and the dredging spoil is placed on the town property south of the entrance channel.

RECOMMENDATION

63. The Division Engineer recommends the modification of the existing project for the Connecticut River below Hartford, Connecticut to provide for an entrance channel 6 feet deep, generally 60 feet wide, and 1,200 feet long from the Connecticut River into Wethersfield Cove; and a 30-acre anchorage, 6 feet deep, in the Cove generally as shown on the inclosed map; at an estimated cost of $80,000 for construction and $1,100 annually for maintenance; provided that, prior to construction, local interests agree to: (a) contribute in cash 50 percent of the cost of construction, and that such contribution, presently estimated at $40,000, be paid in a lump sum prior to commencement of construction, the final allocation of cost to be made after actual costs have been determined; (b) provide without cost to the United States all lands, easements, rights-of-way, and suitable spoil disposal areas with adequate dikes or bulkheads for the construction and maintenance of the project, when and as required; (c) hold and save the United States free from damages due to construction and maintenance of the project; and (d) maintain adequate public access and landings with suitable supply facilities, and regulate the use, growth, and free development of the Cove with the understanding that public facilities and the Cove will be open to all on equal terms. The net cost to the United States for the recommended plan of improvement is estimated at $40,000 for construction and $1,100 annually for maintenance.

KARL F. EKLUND
Colonel, Corps of Engineers
Acting Division Engineer

CONNECTICUT RIVER BELOW HARTFORD
WETHERSFIELD COVE, CONNECTICUT

APPENDIX A

ESTIMATE OF FIRST COST

1. The first cost is given below for the improvement recommended in this report. Federal construction consists of dredging to provide a 60-foot wide channel and a 30-acre anchorage 6 feet deep. No construction is required of local interests, but the navigation buoys now maintained by local interests will have to be removed for construction and relocated after the improvement is completed.

2. Probings made during the study indicate that dredging will consist of mud and sand which can be removed by hydraulic dredge or dragline and placed on adjacent land areas. Dredging quantities are in terms of in-place measurement and include an allowance of 1 foot of overdepth and side slopes of 1 vertical on 3 horizontal. Cost estimates are based on prices prevailing in June 1960.

3. The detailed estimate of cost is as follows:

PROJECT COST ESTIMATE

Cost Account Number	Item		Cost Estimate (x $1,000) (Jun 60)
09	CHANNELS - 6' channel and anchorage		
	(Dredging 35,000 c.y. @ $1.20 - 42.0)		
	(Cutting and removal of trees, stumps and roots . 18.0)		
	(Contingencies @ 15% 9.0)		69.0
29	PREAUTHORIZATION STUDIES		7.0
30	ENGINEERING & DESIGN		5.0
31	SUPERVISION & ADMINISTRATION		6.0
	TOTAL COST (Corps of Engineers Funds and Non-Federal Contributions)		87.0
	Non-Federal Contributions		40.0
	TOTAL NON-FEDERAL COSTS		
	Lands and Damages	0	
	Relocations	0	
	Other:		
	Cash Contribution (50% of 80.0)	40.0	
	TOTAL NON-FEDERAL COSTS	40.0	

SUMMARY OF ESTIMATED COSTS

Federal Cost	
Corps of Engineers	47.0
Coast Guard	0
Required Non-Federal Costs	
Cash Contribution	40.0
TOTAL FEDERAL AND REQUIRED NON-FEDERAL COSTS	87.0

CONNECTICUT RIVER BELOW HARTFORD

WETHERSFIELD COVE, CONNECTICUT

APPENDIX B

U. S. FISH AND WILDLIFE SERVICE REPORT

By letter of 3 November 1959 the Regional Director of the United States Fish and Wildlife Service was advised of the plan of improvement shown on the report map and requested to comment on the effect of the improvement on fish and wild life. It was explained that the estimated 35,000 cubic yards of spoil probably would be placed on the low area south of the entrance channel, and that the lowland area north of the Cove, which is designated as a natural wildlife area, would not be disturbed or used for disposal of spoil. The full report of the Fish and Wildlife Service is reproduced on the following page.

ADDRESS ONLY THE
REGIONAL DIRECTOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
59 TEMPLE PLACE
BOSTON, MASSACHUSETTS

NORTHEAST REGION
(REGION 5)
MAINE
NEW HAMPSHIRE
NEW YORK
VERMONT
PENNSYLVANIA
MASSACHUSETTS
NEW JERSEY
RHODE ISLAND
DELAWARE
CONNECTICUT
WEST VIRGINIA

December 22, 1959

Division Engineer
New England Division
U. S. Corps of Engineers
424 Trapelo Road
Waltham 54, Massachusetts

Dear Sir:

In cooperation with the State of Connecticut Board of Fisheries and Game, we have reviewed the plan of improvement for Wethersfield Cove, Connecticut as outlined by Mr. John W. Leslie in a letter to us dated November 3, 1959.

We conclude that the proposed improvements will have no adverse effect upon either fish or wildlife, provided the spoil is deposited in the area designated on the map which accompanied Mr. Leslie's letter.

Sincerely yours,

John S. Gottschalk
Regional Director

CONNECTICUT RIVER BELOW HARTFORD

WETHERSFIELD COVE, CONNECTICUT
Information Called for by Senate Resolution 148, 85th Congress,
Adopted 28 January 1958

1. Navigation Problems. Wethersfield Cove is located on the Connecticut River about 3 miles below Hartford, Connecticut and 48 miles up river from Long Island Sound. The Cove is about 70 acres and circular in shape with a mean range of tide of about 1 foot. It is used exclusively by recreational craft.

2. The chief navigation difficulty is the result of the shallow depths at the entrance to Wethersfield Cove, along the sides of the entrance channels and in the anchorage.

3. Improvement Considered. Local interests expressed the need for dredging the area between the Connecticut River channel and the entrance to the Cove, widening the entrance channel and dredging the entire anchorage, all to a depth of from 10 to 12 feet. As the deepest draft boat using this Cove would be about 4.5 to 5 feet a channel of 6 feet is adequate for present and anticipated needs of recreational boating in the Cove. The depth of 6 feet was also limited by the top elevation of an outfall sewer which crosses the Cove. The high additional cost of lowering the sewer could not be justified in light of the few boats which might require the additional depth.

4. Recommended Improvements. To provide safer passage and reduce the possibilities of grounding for the type of boats expected to use the channel, the improvement recommended provides for an entrance channel 6 feet deep, generally 60 feet wide and a 30-acre anchorage 6 feet deep in the Cove. Estimated first costs, annual costs and annual benefits based on June 1960 price levels; a 50-year project life and an interest rate of 2 5/8 percent on Federal funds and 3½ percent on non-Federal funds are as follows:

a. Estimated First Costs of Construction:

Federal	$40,000(1)
Non-Federal	40,000(2)
Total Estimated First Cost of Construction	$80,000

(1) Excludes preauthorization study costs of $7,000.
(2) Cash contribution of 50% construction cost.

b. Estimated Annual Charges:

	Federal	Non-Federal	Total
Interest and Amortization	$1,700	$1,700	$3,400
Maintenance	1,100	0	1,100
Total Estimated Annual Charges	$2,800	$1,700	$4,500

c. Estimated Annual Benefit: Increased recreational use of the existing fleet, prospective fleet - normal growth, existing transient fleet, attracted transient boats, attracted new boats, and attracted transferred boats.

General	Local	Total
$3,300	$3,300	$6,600

d. Benefit - Cost Ratio = 1.5

5. Apportionment of Cost and Local Cooperation. In view of the local benefits, local interests would be required to contribute in cash 50% of the cost of construction. The authorized work would be subject to the conditions that local interests:

a. Make a cash contribution of 50% of the construction costs of the improvement, a contribution currently estimated at $40,000.

b. Maintain adequate public access and landings open to all on equal terms.

c. Provide necessary spoil disposal areas and all retaining dikes, bulkheads or embankments necessary for spoil disposal for subsequent maintenance, when and as required.

d. Provide without cost to the United States all necessary lands, easements, and rights-of-way for the construction and maintenance of the project.

e. Hold and save the United States free from damages that may result from construction and maintenance of the project.

6. Discussion. Local interests have approved the recommended plan and indicated that the requirements of local cooperation would be met. The measures recommended provide a logical and economically feasible means of meeting the needs of navigation in the area. Analysis on the basis of an economic life of 100 years would increase the benefit-cost ratio from 1.5 to 1.7. The project is considered justified on the basis of studies and criteria in the report. Proposed local cooperation is consistent with other similar projects.

WILDLIFE AREA
(PROPERTY OF CITY OF HARTFORD)

PROPOSED HIGHWAY LOCATION
CLEARANCES
Horizontal 70 feet
Vertical 40 feet above M.L.W.

EXISTING UNDER-GROUND SEWER
Elevation of top of sewer 6.2 feet below M.L.W.

FOLLY BROOK

WETHERSFIELD COVE

6-FOOT CONTOUR

6-FOOT CONTOUR

6-FOOT CONTOUR

COVE PARK

TOWN LAUNCHING RAMP

TOWN LANDING

TOWN WHARF

POSSIBLE SPOIL DISPOSAL AREA

WETHERSFIELD COVE YACHT CLUB

WETHERSFIELD STATE PRISON

CONNECTICUT RIVER

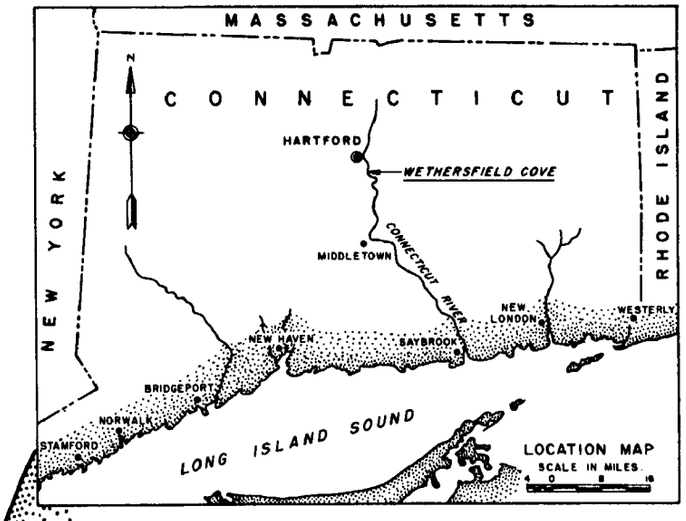
flood
Ebb

N

RECOMMENDED IMPROVEMENT

CHANNEL - 6 FEET DEEP

ANCHORAGE - 30 ACRES
6 FEET DEEP



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

CONNECTICUT RIVER BELOW HARTFORD
WETHERSFIELD COVE
CONN.

SHEET 1 OF 1 — SCALE IN FEET 200 0 200 400 600 — JULY 1960

APPROVED
CHIEF, ENGINEERING DIVISION

SUBMITTED
CHIEF, PLANNING AND REPORTS BRANCH

CHIEF, RIVER AND HARBOR SECT.

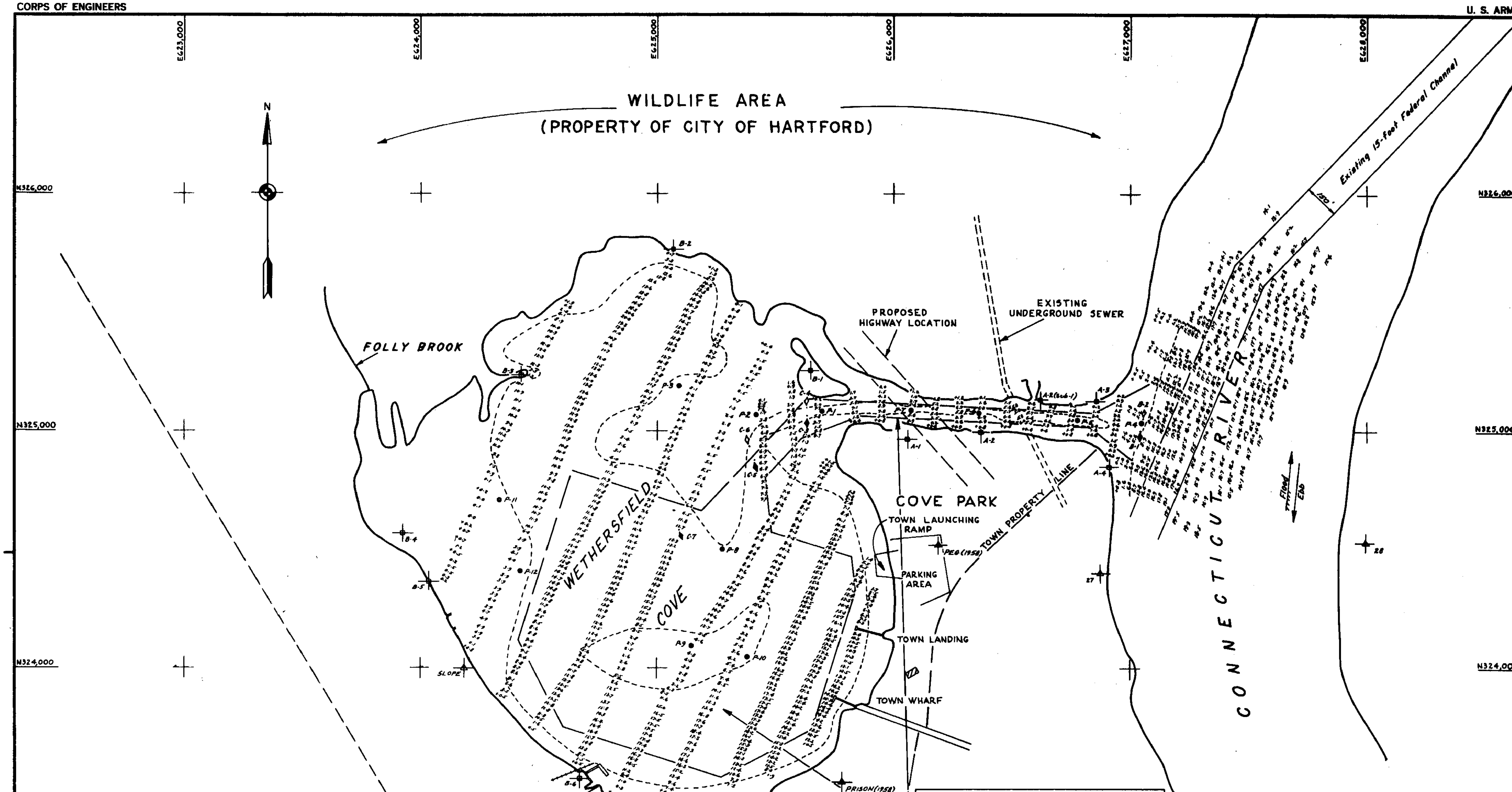
PROJECT ENGINEER

DR BY EOP
TR BY EOP
CH BY ALD

TO ACCOMPANY SURVEY REPORT DATED JULY 7, 1960

FILE NO. W.C. 2

PLATE 1



LIST OF PROBINGS

NUMBER	ELEVATION BELOW M.L.W. DEPTH OF WATER	DEPTH OF PROBE	PENETRATION	MATERIAL
1	6.3	10.4	4.1	Mud & Sand
2	2.3	10.4	8.1	do
3	3.5	10.4	6.9	do
4	5.2	10.5	5.3	do
5	8.1	11.4	3.3	do
6	6.2	11.2	5.0	do
7	5.9	11.3	5.4	do
8	6.0	11.1	5.1	do
9	4.1	11.0	6.9	do
10	3.8	10.9	7.1	do
11	1.9	10.8	8.9	do
12	4.5	10.7	6.2	do

NOTES:

Soundings and probings are in feet and tenths and are referred to the plane of Mean Low Water.

Hydrography and topography from survey of Sept. 30, Oct. 2-7, and Dec. 15, 1958 by H.A. Fishlock.

B.M. No. 49. A chiseled knob in flat brown stone, 3 feet by 6 feet, about 30 feet north of Ballards Dock and about 60 feet east of the top of the dike. The knob is on the west edge of the stone and 1 foot south of the north edge. Elev. above M.L.W. 9.40 Feet.

6-foot contour shown thus: — – — – —

Field books: R. & H. 1430, 1450, 1452 & 1616.

Probings are shown thus: P-9 ●

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS, WALTHAM, MASS.

CONNECTICUT RIVER BELOW HARTFORD

WETHERSFIELD COVE, CONN.

SURVEY MAP

SHEET 1 OF 1 — SCALE IN FEET (200 0 200 400 600) — JULY 1960

APPROVED: John Wm. Leslie — CHIEF, ENGINEERING DIVISION

SUBMITTED: — CHIEF, PLANNING AND REPORTS BRANCH

CHIEF, RIVER AND HARBOR SECT.

PROJECT ENGINEER

DR. BY EOP — TR. BY ALD — CH. BY

TO ACCOMPANY SURVEY REPORT DATED JULY 7, 1960

FILE NO. W.C. 3